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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/510,591	10/08/2004	Hendrik Klaas Kloen	NL02 0327 US	9251

24738 7590 07/14/2005

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EXAMINER	
CHU, CHRIS C	

ART UNIT	PAPER NUMBER
2815	

DATE MAILED: 07/14/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/510,591	KLOEN ET AL.	
	Examiner	Art Unit	
	Chris C. Chu	2815	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *21 June 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1 - 6* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1 - 6* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *10/8/04*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

1. Applicant's election filed in the response June 21, 2005 of Group I is acknowledged. Since applicant cancelled claims 7 – 12, the election will be treated as being without traverse and the elected Group I thereunder will be examined.

Information Disclosure Statement

2. The listing of references, e.g., EP-A 1160858, in the specification is not a proper information disclosure statement. 37 CFR 1.98(b) requires a list of all patents, publications, or other information submitted for consideration by the Office, and MPEP § 609 A (1) states, "the list may not be incorporated into the specification but must be submitted in a separate paper." Therefore, unless the references have been cited by the examiner on form PTO-892, they have not been considered.

Specification

3. The abstract of the disclosure is objected to because the abstract should not refer to a specific embodiment of the invention when there are several embodiments in the specification of the invention. Thus, "Fig. 1" in line 8 should delete. Correction is required. See MPEP § 608.01(b).

4. The disclosure is objected to because of the following informalities: the specification of the instant invention lacks subtitles i.e., "BACKGROUND OF THE INVENTION," Field of the Invention, Description of the Related Art, "SUMMARY OF THE INVENTION," etc.

Appropriate correction is required.

Claim Objections

5. Claim 1 is objected to because of the following informalities:

(A) In claim 1, line 3, "electroconductive layer" should be -- the first electroconductive layer--, because "electroconductive layer" lacks antecedent basis and consists with other claims.

(B) In claim 3, line 2, "the apertures" should be --apertures--, because "the apertures" lacks antecedent basis.

Appropriate correction is required.

Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

7. Claims 1 – 3 are rejected under 35 U.S.C. 102(b) as being anticipated by Tsuji et al. (U. S. Pat. No. 5,656,550).

Regarding claim 1, Tsuji et al. discloses in e.g., Fig. 21C a semiconductor device (the device in e.g., Fig. 21C) comprising

- a carrier (60 in Fig. 20A; column 16, line 28) with a first and a second side situated opposite to each other,
    - o which carrier has a first electroconductive layer (62; column 16, line 33) on the first side (see e.g., Fig. 21C),
    - o which electroconductive layer (62) is patterned in accordance with a desired pattern, thereby defining a number of mutually isolated connection conductors (27; column 16, line 37 and see e.g., Fig. 21C),
- on which first side of the carrier a semiconductor element (41; column 17, line 27) is present (see e.g., Fig. 21C),
    - o which semiconductor element (41) is provided with connection regions (41a; column 17, line 29) that are electroconductively connected via connection means (43; column 17, line 32) with the connection conductors (27) of the carrier (see e.g., Fig. 21C),
    - o which semiconductor element (41) is encapsulated in a passivating envelope (23; column 17, line 33) that extends as far as the carrier (see e.g., Fig. 21C),
- on which second side, contact surfaces (at the surface of the elements 63) are defined in the connection conductors (27) for placement on a substrate (column 35, line 16),
- characterized in that the envelope (23) is mechanically anchored in the connection conductors (27), for which purpose the connection conductors (27) are provided with side faces having recesses (see e.g., Fig. 21C and column 17, lines 1 – 6).

Regarding claim 2, Tsuji et al. discloses in e.g., Fig. 21C in addition to the first layer (62), the carrier comprises a second layer (61 in Fig. 20A) and a third layer (63; column 16, line 33), the second layer comprising a material that can be etched in an etchant that leaves the first and the third layer substantially in tact (see e.g., Fig. 21C and column 17, lines 1 – 6).

Regarding claim 3, Tsuji et al. discloses in e.g., Fig. 21C apertures (the gaps or openings between the element 27 and the elements 28A) extending as far as the second side of the carrier (see e.g., Fig. 21C).

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

9. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Tsuji et al. in view of Rostoker (U. S. Pat. No. 5,340,771).

While Tsuji et al. discloses the connection means being wires, Tsuji et al. does not teach the connection means could be bumps. Rostoker teaches in e.g., Fig. 1a the connection means also being bumps (108; column 5, line 57), which bumps (108) are also used to attach a semiconductor element (102; column 5, lines 56 – 57) onto a carrier (110; column 5, lines 49 – 50). It would have been obvious to one of ordinary skill in the art at the time when the invention was made to apply the bumps of Rostoker on the semiconductor element of Tsuji et al. as taught by Rostoker to increase the number of I/O connections (column 4, lines 6 – 7).

10. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Tsuji et al. in view of Osawa et al. (U. S. Pat. No. 6,077,727).

While Tsuji et al. discloses the carrier having first, second and third layers, Tsuji et al. does not teach the first and third layer being copper and the second layer being aluminum. Osawa et al. teaches in e.g., Fig. 9D first (52; Cu, column 1, lines 32 – 33) and third (53; Cu, column 1, lines 31 – 32) layers being composed by a copper and the second layer (51) being composed by an aluminum (column 1, line 32). It would have been obvious to one of ordinary skill in the art at the time when the invention was made to apply the copper and aluminum of Osawa et al. as the specific material to form the first, third and second layers in the carrier of Tsuji et al. as taught by Osawa et al. to selectively remove by the etching process (column 1, lines 37 – 38).

11. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Tsuji et al. in view of Harada (U. S. Pat. No. 6,091,144).

While Tsuji et al. discloses the use of the carrier, Tsuji et al. does not teach the carrier comprising a number of electrically insulating and conductive layers, at least one passive component being embedded in said layers. Harada teaches in e.g., Fig. 4A a carrier (22a, 12, 14a and 14b) comprising a number of electrically insulating (26a, 26b and 32; column 6, lines 25 – 26) and conductive layers (12, 28a and 28b; column 6, lines 24 – 25), at least one passive component (22a; capacitor, column 6, line 23) being embedded in said layers (12, 26a, 26b, 28a, 28b and 32; see e.g., Fig. 4A). It would have been obvious to one of ordinary skill in the art at

the time when the invention was made to apply the number of electrically insulating and conductive layers and the passive component of Harada into the carrier of Tsuji et al. as taught by Harada to reduce adverse effect of noise on external circuits (column 3, lines 12 – 13).

Conclusion

12. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Lin, Jung et al., Sakamoto et al. and Sasaoka et al. disclose a semiconductor package that has arched openings in a carrier.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Chris C. Chu whose telephone number is 571-272-1724. The examiner can normally be reached on 11:30 - 8:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tom Thomas can be reached on 571-272-1664. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov.

Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Chris C. Chu
Examiner
Art Unit 2815

c.c.
Thursday, June 30, 2005

Tom Thomas

TOM THOMAS
SUPERVISORY PATENT EXAMINER